3.8 FUTURE CASE MODELING

This section describes the photochemical modeling and related analyses conducted to demonstrate attainment of the 8-hour ozone standard in the BPA nonattainment area for the year 2007. As previously mentioned, 1-hour ozone modeling is required in order to develop 8-hour statistics; thus, data on 1-hour modeling is included in this section.

In this section, 1-hour data for the 2007 and 2005 future years are discussed first in order to demonstrate projected improvement in air quality for 1-hour ozone concentrations. Then, results of future case analyses for 8-hour ozone are discussed in order to demonstrate attainment of the 8-hour ozone standard by the attainment year of 2007.

Future case modeling includes all adopted rules statewide and nationally. The modeled rules developed to allow the HGB area to reach attainment of the1-hour standard by 2007 are included. The rules proposed for HGB are described in the HGB Phase II MCR SIP revision, and are denoted in that document as control strategy 08, or CS-08 Modeling of these rules is particularly important in future case BPA modeling for the episode during which transport from HGB to BPA occurred (August 30 - September 1, 2000). The future case modeling also includes the effects of 3 tons/day NOx reductions due to TERP in BPA, and an increase of NOx and VOC emissions associated with the construction of three LNG terminals and their associated pipelines.

3.8.1 1-Hour Ozone Data

Figure 3.8-54 shows the 1-hour peak ozone generated in the base (2000) and future case (2007) modeling in the BPA area, both compared to the ozone peaks observed each day during the episode at the monitoring sites in the area. Data from two different episodes are included in this figure: the local/stagnation episode (August 12 and 13, 2000) and the transport episode (August 29 - September 6, 2000). All runs were conducted with the most recent version of CAMx, version 4.03 and the most recent emissions estimates and control strategies for the BPA area.

Figure 3.8-54 shows that the future case controls will improve air quality by reducing the ozone below the base case level on all days during both episodes, although on some days there is more reduction, and on some days less. (Data for September 5 in this figure have been discounted because of poor model performance in the base case). However, as shown in the figure, based on future case modeling the results for two days in the future case show that 1-hour ozone peaks would remain near or above 125 ppb in 2007.

Table 3-56 shows the same data in numerical form. The last line of the table quantifies the amount of ozone reduction achieved by 2007 as a result of invoking the control strategies. Data from September 5, 2000 has been removed from the table because, as previously noted, base case model performance for that date does not meet EPA criteria.

Table 3-56: Observed and Modeled Ozone Data (ppb)

Ozone\Date	8/12	8/13	8/29	8/30	8/31	9/1	9/2	9/3	9/4	9/6
Observed Peak	126	102	114	165	152	160	101	107	115	113
Base Case Peak	120.6	93.9	105.3	123.6	149.9	129.5	137.0	123.9	128.7	108.4
Future Case Peak	114.5	92.5	90.6	112.7	134.8	119.8	119.4	110.1	123.6	105.7
Ozone Reduction	6.1	1.4	14.7	10.9	15.1	9.7	17.6	13.8	5.1	2.7

On August 31, the modeled peak responds well to the control strategies, reducing ozone by 15.1 ppb, more than any other day except September 2. However, on August 31 the future case ozone is projected to be 134.8 ppb, approximately 10 ppb above the 1-hour the standard.

Table 3-57: Change in Modeled Area of Exceedance

Ozone\Date	8/12	8/13	8/29	8/30	8/31	9/1	9/2	9/3	9/4	9/6
Base Case (km^2)	0	0	0	0	720	256	80	0	48	0
Future Case (km^2)	0	0	0	0	224	0	0	0	0	0
Reduction (%)	---	---	---	---	69	100	100	---	100	---

Similarly, Table 3-57 shows the future case controls provide significant reductions in the area of exceedance for 2007. On August 31, the area of 1-hour exceedance is shown to be reduced from 720 km^2 to 224 km^2, a reduction of nearly 70 percent in the area affected by high ozone. It is clear that both the peak ozone concentrations and the area of exceedance are reduced during every day of the episode, and that overall, the future case controls are effective in improving air quality BPA area between 2000 and 2007.

3.8.1.1 Future Case Model Response for 1-Hour Ozone

For the 2007 future case, the model responded well to controls every day, including August 31, but on that day the peak ozone was projected to remain above 125 ppb. Special efforts were made to determine why the ozone would remain high in the modeled future case for that date. Based upon that extensive analysis, staff concluded that there are two primary factors that determine the high ozone production on August 31, and make it difficult to bring the ozone down below 125 ppb. Both factors are linked to the unusual meteorology that occurred during the period.

Temperature Effects

Temperatures were extraordinarily high on August 30, 31 and September 1, similar to the high temperatures measured in the HGB area, and high enough to set local temperature records in the BPA area on September 3rd. The average maximum temperature in the BPA area during August is 90.6 degrees Fahrenheit. Climatologically speaking, temperatures above 96 degrees occur only 10 percent of the time, and temperatures hotter than 98 degrees are beyond the 95th percentile.

The peak temperature measured on August 30 was 102.8 degrees at 4:00 in the afternoon at Mauriceville, CAMS 642. On August 31, the max temperature was even higher, and peaked at 106.7 at 3:00 PM, again at CAMS 642. On September 1, the peak temperature was 103.7 degrees, and 103.9 on the September 2. On September 3, the temperatures reached 106.2 degrees and set a local record. By September 6, the peak temperature had fallen to 103.9 degrees at CAMS 119.

Detailed analysis and sensitivity tests done for the high temperatures that occurred during the same period in the HGB area have shown that ozone chemistry is very sensitive to high temperatures, much more so than originally thought. Since CAM_X uses temperature to influence the rate of reaction in its chemistry module, the high temperatures drive the ozone very high during the period. Since the meteorology is validated in the base case and the same temperatures are used in the future case, ozone production in the future case was also very high on August 30, 31, and September 1.

Temperature also impacts the emissions in the model. High temperatures increase biogenic activity, particularly the isoprene emissions from the oak forests in the area. Although drought conditions tend to reduce those isoprene emissions somewhat, the net isoprene production during the period remained very high. Since the biogenic isoprene emissions remained high, the ozone production remained high despite the future case controls on the anthropogenic sources in the BPA area.

Four sensitivity tests (two for the base case and two for the future case) were run to evaluate the impact of high temperatures and increased biogenic emissions in the BPA area on August 31 model results. The tests were run using the same testing procedures and dates as used for HGB, but evaluated for impacts in the BPA area. In the first sensitivity test, the August 31 wind fields and mixing height data were not changed; only the temperatures and humidity were adjusted. The August 31 temperatures and humidities were replaced with data taken from the MM5 output for August 25, which was a cooler day with closer to normal temperatures and humidity.

The second sensitivity test evaluated the impact of the reduced mobile and biogenic emissions associated with the August 25 cooler temperatures. The temperature and humidity fields were again taken from August 25 and the winds and mixing height were unchanged. The biogenic emissions were taken from the August 25 data set to correspond with the August 25 temperatures, but the mobile source emissions were taken from August 21 (a Monday) to avoid using the higher mobile emissions associated with Fridays. Since mobile source VOC emissions are a relatively small component of the BPA inventory, this second sensitivity test essentially addresses the impact of biogenic rather than anthropogenic emissions.

Table 3-58: Results of Temperature and Emissions Sensitivity Tests

August 31st, 2000 Test Results in BPA Area	Base Case Ozone (ppb)	Reduction (ppb)	Future Case Ozone (ppb)	Reduction (ppb)
Benchmark Peak Ozone	149.9	---	134.6	---
Temperature Reduction Test Alone	130.4	19.5	117.5	17.1
Reduced Emissions and Temperature	124.3	25.6	111.8	22.8

Table 3-58 shows that CAMx chemistry is significantly sensitive to cooler temperatures, as well as sensitive to the reductions in biogenic emissions caused by lower temperatures. If the temperatures on August 31 had not been so hot, less ozone would have been produced, and the BPA emissions controls would have been shown by the modeling to provide more improvement in air quality in 2007.

Transport Issues

Data analysis has also shown that BPA has significant transport from the HGB area on August 30, 31 and September 1. Plume plots for August 30 and 31 show that the night and morning winds carried a plume from HGB, southeast toward the Gulf of Mexico. The high concentrations of ozone generated in the plume during the day were then carried into the BPA area when the afternoon sea breeze shifted to the southwest.

Figure 3.8-55 shows the wind flow pattern on August 30. The red lines connect the locations of parcels that were released from areas such as the Ship Channel as they were carried to the southeast. The peak 1-hour ozone concentration was 165 ppb that day as the Houston plume was carried over the Sabine Pass monitor by the southwesterly sea breeze, late in the evening at 7:00 PM. Figure 3.8-56 shows a similar pattern on August 31st, with the peak 1-hour ozone occurring as the Houston plume approaches from the southwest during the afternoon sea breeze wind shift at 3:00 PM. Figure 3-57 shows a slightly different pattern on September 1, with direct transport from Houston, east into the BPA area.

The analysis for all three days suggests that the Houston plume can have a significant impact on the BPA area.

OSAT Analysis

The transport phenomenon discussed previously is also replicated quite well in CAMx, as illustrated by the Ozone Source Apportionment Technique (OSAT) time series in Figure 3.8-58. Notice that on August 30, and 31, the 1-hour ozone spikes are comprised differently in the morning and the afternoon. In the morning, the ozone is largely attributed to BPA sources, but in the afternoon, the majority of the ozone is shown to be due to HGB sources. The distinct transition between the morning and afternoon ozone composition shows the impact of the HGB plume moving into the BPA area. Numerical analysis of the OSAT data (Table 3-59) confirms the plume analysis by showing that the Houston contribution changes in a very short time period. On August 31, the 3:00 PM data indicates that HGB contributes 11 ppb to the total ozone at the Sabine Pass, whereas BPA contributes 34 ppb. The contribution changes dramatically in the afternoon. By 5:00 PM, only two hours later, HGB is responsible for 43 ppb, whereas BPA sources contribute only 11 ppb. On September 1, the direct transport day, OSAT data indicate that HGB contributes 59 ppb to the total ozone at the Hamshire monitor, whereas BPA contributes less than 1 ppb.

Table 3-59: Contributions to Ozone (ppb)

	Aug 31 @ 3:00 PM	**Aug 31 @ 5:00 PM**
Initial Conditions	1.14	1.03
Boundary Conditions	23.69	23.03
Non HGB/BPA	56.80	42.38
HGB Contribution	11.32	43.37
BPA Contribution	34.22	11.15
Total Ozone (ppb)	**127.17**	**120.96**

3.8.1.2 Estimating Future Design Values for 2007

As a result of the high temperatures, the high biogenics and the large HGB contribution on August 31, it is not surprising that ozone concentrations are predicted to be high in the BPA area. Despite good model response, these factors make it difficult to model the peak ozone below 125 ppb with local controls on that day.

Particularly in this case, it is appropriate to apply EPA's recent thinking developed for the new 8-hour standard to the daily peak analysis for 1-hour ozone. The EPA's new ensemble approach provides a more robust analysis since it evaluates model response over all of the days in the episode. Since this modeling includes two episodes, selected to include the a variety of meteorological conditions leading to ozone in the BPA area, an ensemble of model results from all the valid days in the episode is far more representative than any single day.

In EPA's document, *Draft Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-Hour Ozone NAAQS* (EPA-454/R-99-004, May 1999, http://www.epa.gov/scram001/guidance/guide/drafto3.pdf), the EPA notes that states should use the results of photochemical modeling in a relative manner to determine attainment of the 8-hour standard. This approach calls for calculating the average reduction generated between the base and future cases, and then applying that reduction factor to the measured design value for the area. In this section, the application of this approach to 1-hour ozone data is explained.

The EPA procedures for computing the Relative Reduction Factor (RRF) are complex. In general, the procedure involves determining an appropriate data set in which the model results properly represent the ozone measured during the episode, and determining how well the model responds each day to the control package at each monitoring site in the region. From this set, the average response at each monitor (RRF) is calculated. Then the monitor specific RRF is multiplied by the current Design Value (DVc) for each monitor to estimate the future Design Value (DVf) ozone that will result at that monitor from a set of controls. Finally, the highest of those monitor specific DVfs determines the DVf for the area as a whole.

The commission has developed a similar approach for estimating the future Design Values for 1-hour peak ozone, and has applied it to the results of the 1-hour BPA modeling. The results of the analysis are listed below in Table 3-60, and the underlying RRF calculations are presented at the end of this section in Table 3-63. In Table 3-60 below, there are two recent design values, the design value for the modeling year (DVm) and the design value for the current year (DVc). The higher of the two values for each station (identified in bold text) is then multiplied by the monitor specific relative reduction factor (RRF) to determine the future design value for each site. The highest of these future design value computations is the future Design Value (DVf) for the BPA area. For the calculated future 1-hour design values, the decimal digits are truncated for consistency with EPA's guidance for calculating 8-hour design values.

Table 3-60: 2007 Future Design Value Computation for 1-hour Ozone

Monitor Site	Bmt/2	Ham/64	PAW/28	Sab/40	Mrc/42	JCA/43	WOr/9
DVm (1999-2001)	**104**	**121**	**116**	**134**	95	**132**	**118**
DVc (2001-2003)	101	101	101	129	**108**	109	110
Relative Reduction Factor (RRF)	.92	.81	.90	.86	.93	.89	.90
1-Hour Future Design Value (DVf)	95	98	104	115	100	117	106

- The 1-hour modeling year Design Value (DVm) is calculated over the three-year period (1999-2001) which includes the two years bracketing the 2000 episode. The highest DVm is 134 ppb at Sabine Pass (CAMs 40).

- The 1-hour current year Design Value (DVc) is calculated to reflect the most recent three years of data (2001-2003). The highest DVc for this period also occurs at Sabine Pass and is 129 ppb.

- The bottom line of the table shows the future Design Value for each site, calculated by multiplying the higher of these two values by the RRF calculated from the modeling and then truncating the decimal digits as required in the EPA guidance.

- The future Design Value for the entire BPA area is defined as the highest of the calculated model specific future design values.

The highest calculated future design value is 117 ppb and occurs at the Jefferson County Airport (JCA/43). So the future year 1-hour Design Value for the BPA area is 117 ppb, which shows significant improvement in air quality from 2000 to 2007.

3.8.1.3 Estimating Future Design Values for 2005

An analysis has been conducted to determine the future 1-hour ozone design value for 2005, using procedures similar to those discussed above for 2007.

For this analysis, the controls, or extent of controls, that will be in place by 2005, both for BPA and HGB are provided in Table 3-61.

Table 3-61: Control Measure Implementation Schedule

Area Affected	Control Measures	Implementation Schedule
HGB	Chapter 115 Highly Reactive VOC Rules	Instrumentation in place by 2005, Site Wide Cap Compliance by April 2006
BPA	BPA Chapter 117 NO_x Rules	First 2/3 by May 2003, Final 1/3 by May 2005
HGB	HGB Chapter 117 NO_x Rules	Approximately 80% by 2005, Final 20% by 2007

A simple computation demonstrates that there should be significant improvement in BPA air quality for 1-hour ozone between 2000 and 2005. As previously noted in Table 3-60, the future design value computations show a large improvement in air quality by 2007. If 80 percent of the NO_x controls for HGB are in place in 2005, we can assume approximately 80 percent of the reductions shown in Table 3-60. This analysis shows that the BPA area will attain the 1-hour ozone standard in 2005. Recomputing and rounding based upon 80 percent of the proposed NO_x controls in HGB gives the results shown in Table 3-62.

Table 3-62: 2005 1-hour Design Value Recomputed for 80% NOx Controls in HGB

Monitor Site	Bmt/2	Ham/64	PAW/28	Sab/40	Mrc/42	JCA/43	WOr/9
DVm (1999-2001)	**104**	**121**	**116**	**134**	95	**132**	**118**
DVc (2001-2003)	101	101	101	129	**108**	109	110
Relative Reduction Factor (RRF)	.92	.81	.90	.86	.93	.89	.90
2007 1-hour DVf	95	98	104	115	100	117	106
80% RRF	0.936	0.845	0.918	0.890	0.943	0.910	0.918
2005 1-Hour DVf	97	102	106	119	101	120	108

Therefore, even with only 80 percent of the HGB NO_x controls in place in 2005, the analysis still shows a very good improvement in air quality in the BPA area from 2000 to 2005.

Table 3-63: Beaumont/Port Arthur Relative Reduction Factor Computations for 1-hour Ozone

Ozone Concentrations (ppb) of 2000 Base Case base5b.pto2n2 (8/12-13/2000) and base5c.psito2n2 (8/29-9/6/2000)

Site	8/12/2000	8/13/2000	8/29/2000	8/30/2000	8/31/2000	9/1/2000	9/2/2000	9/3/2000	9/4/2000	9/6/2000
BMTC	[78.32]	92.14	103.67	107.1	130.41	125.08	114.01	86.62	100.57	[83.77]
HAMS	[82.69]	[92.49]	[85.58]	[90.47]	116.61	124.73	124.3	101.94	[99.57]	[94.76]
PAWC	101.56	[91.61]	[80.35]	100.92	112.99	114.23	97.81	107.72	118.42	[92.97]
S40S	108.48	[78.54]	[54.28]	108.1	133.77	110.48	[74.32]	[87.76]	105.02	107.28
S42S	[59.63]	84.33	100.42	101.67	92.32	118.45	96.16	92	79.91	81.44
S43S	101.56	[92.20]	[85.48]	[99.52]	112.81	114.23	114.52	[97.28]	113.01	[92.97]
WORA	[86.24]	[92.24]	[97.99]	109.96	118.73	118.97	120.01	[92.98]	[90.21]	[84.71]

Ozone Concentrations (ppb) of 2007 Case fy07m.cs08

Site	8/12/2000	8/13/2000	8/29/2000	8/30/2000	8/31/2000	9/1/2000	9/2/2000	9/3/2000	9/4/2000	9/6/2000
BMTC	[72.05]	91.4	90.26	102.48	117.4	117.55	99.28	78.62	94.41	[78.89]
HAMS	[71.34]	[90.33]	[67.88]	[77.81]	94.43	98.97	100.77	82.88	[92.91]	[86.88]
PAWC	96.14	[90.94]	[75.72]	95.98	103.15	91.7	81.03	95.54	113.11	[90.01]
S40S	91.53	[75.37]	[53.48]	88.75	116.07	90.07	[63.66]	[70.89]	90.1	104.7
S42S	[57.98]	81.8	90.09	97.22	81.68	101.56	86.77	89.52	78.97	78.9
S43S	95.34	[92.46]	[79.52]	[94.64]	102.07	91.7	98.92	[88.13]	105.56	[89.90]
WORA	[83.34]	[90.13]	[89.76]	104.57	104.35	106.18	104.84	[89.31]	[88.99]	[81.18]

Relative Reduction Factors

Site	8/12/2000	8/13/2000	8/29/2000	8/30/2000	8/31/2000	9/1/2000	9/2/2000	9/3/2000	9/4/2000	9/6/2000	Mean
BMTC		0.992	0.871	0.957	0.9	0.94	0.871	0.908	0.939		**0.92**
HAMS					0.81	0.793	0.811	0.813			**0.81**
PAWC	0.947			0.951	0.913	0.803	0.828	0.887	0.955		**0.9**
S40S	0.844			0.821	0.868	0.815			0.858	0.976	**0.86**
S42S		0.97	0.897	0.956	0.885	0.857	0.902	0.973	0.988	0.969	**0.93**
S43S	0.939				0.905	0.803	0.864		0.934		**0.89**
WORA				0.951	0.879	0.892	0.874				**0.9**

3.8.2 Attainment Analysis for 8-hour Ozone

3.8.2.1 Analysis for 2007

As noted previously, EPA has developed a new method for demonstrating attainment of the 8-hour ozone standard. The new method was used to determine whether the BPA area will be in attainment of the 8-hour ozone standard in 2007. The method calculates an average Relative Reduction Factor (RRF) for each monitor in the area, and applies that relative reduction factor to the current design value (DVc) for each monitor to determine the future design value (DVf) for each monitor.

The 8-hour DVf computation method is quite complex. It requires evaluating two three-year periods (one bracketing the episode year, and one representing the three most recent years of data) to determine the current design value. For each monitor in the area the higher of the two design values is used to determine the worst case (bolded in Table 3-64). Once the worst case design value is determined for each monitor, it is multiplied by the monitor specific average RRF (Table 3-65) to determine the future design value expected at each monitor. The decimal digits for each monitor specific future design value are then truncated as required by the EPA 8-hour guidance. The highest of the monitor specific future design values determines the 8-hour future Design Value (DVf) for the area.

Table 3-64: 2007 Future Design Value Computation for 8-hour Ozone

Monitor Site	Bmt/2	Ham/64	PAW/28	Sab/40	Mrc/42	JCA/43	WOr/9
DVm (1999-2001)	**80**	---	**85**	90	**82**	**89**	74
DVc (2001-2003)	78	**75**	78	**91**	76	86	**80**
RRF (Relative Reduction Factor)	.93	.88	.92	.89	.92	.93	.93
DVf (8-Hour Future Design Value)	74	66	78	80	75	82	74

The highest monitored design values are measured at Sabine Pass, for which there is evidence of an impact of transport from the HGB area. The highest design value during the two periods was 91 ppb, measured during the 2001-2003 period. However, the model responded well at that location, and the future case ozone averaged only 89.0 percent of the base case ozone. When the measured ozone at Sabine Pass is multiplied by .890 and truncated, the resulting ozone is 80 ppb. The model is less responsive at the Jefferson County Airport, so the calculated future ozone is 82 ppb, a higher number than at Sabine Pass.

Using the EPA 8-hour computation procedures, the highest DVf (monitor specific future Design Value) is 82 ppb, which is below the 8-hour standard of 85 ppb. Therefore, the 8-hour future case design value calculation indicates that the BPA area will be in compliance with the 8-hour ozone standard in 2007.

Table 3-65: Beaumont/Port Arthur Relative Reduction Factor Computations for 8-hour Ozone

Ozone Concentrations (ppb) of 2000 Base Case base5b.pto2n2 (8/12-13/2000) and base5c.psito2n2(8/29-9/6/2000)

Site	8/12/2000	8/13/2000	8/29/2000	8/30/2000	8/31/2000	9/1/2000	9/2/2000	9/3/2000	9/4/2000	9/6/2000
BMTC	70.16	78.96	86.52	94.4	105.48	107.67	94.5	78.06	82.7	79.33
HAMS	76.39	80.38	75.51	75.69	85.17	100.98	93.21	82.5	91.22	88.13
PAWC	95.76	80.21	[67.10]	94.35	105.26	97.05	83.03	84.05	98.07	85.75
S40S	99.1	72.3	[52.20]	97.52	117.67	94.97	[65.63]	70.84	95.27	99.84
S42S	[57.07]	73.35	84.39	80.23	77.92	102.64	87.5	77.5	71.55	76.49
S43S	92.08	80.84	70.7	94.34	102.92	96.92	90.05	82.83	96.49	85.61
WORA	72.72	83.1	81.94	91.1	95.64	108.4	93.68	79.97	78.07	78.64

Ozone Concentrations (ppb) of 2007 Case fy07m.cs08

Site	8/12/2000	8/13/2000	8/29/2000	8/30/2000	8/31/2000	9/1/2000	9/2/2000	9/3/2000	9/4/2000	9/6/2000
BMTC	65.57	77.5	77.7	88.96	97.32	98.32	84.12	71.76	77.62	74.95
HAMS	67.81	78.14	61.75	66.33	72.48	84.5	79.05	70.94	83.92	82.1
PAWC	90.06	79.23	[62.66]	85.21	94.41	81.81	71.37	73.88	94.5	83.67
S40S	83.75	70.18	[52.17]	82.07	103.04	80.77	[57.84]	60.51	84.91	97.25
S42S	[55.37]	71.56	72.75	73.3	70.52	87.62	76.74	73.31	70.17	74.09
S43S	88.1	80.45	67	85.21	93.17	82.3	78.29	74.73	92.36	83.04
WORA	70.03	81.5	74.76	85.54	86.45	94.84	82.39	72.78	76.95	75.39

Relative Reduction Factors

Site	8/12/2000	8/13/2000	8/29/2000	8/30/2000	8/31/2000	9/1/2000	9/2/2000	9/3/2000	9/4/2000	9/6/2000	Mean
BMTC	0.935	0.982	0.898	0.942	0.923	0.913	0.89	0.919	0.939	0.945	0.93
HAMS	0.888	0.972	0.818	0.876	0.851	0.837	0.848	0.86	0.92	0.932	0.88
PAWC	0.94	0.988		0.903	0.897	0.843	0.86	0.879	0.964	0.976	0.92
S40S	0.845	0.971		0.842	0.876	0.85		0.854	0.891	0.974	0.89
S42S		0.976	0.862	0.914	0.905	0.854	0.877	0.946	0.981	0.969	0.92
S43S	0.957	0.995	0.948	0.903	0.905	0.849	0.869	0.902	0.957	0.97	0.93
WORA	0.963	0.981	0.912	0.939	0.904	0.875	0.879	0.91	0.986	0.959	0.93

3.8.2.2 Analysis for 2005

The new 8-hour ozone implementation rule establishes June 15, 2007 as the attainment date for marginal nonattainment areas such as BPA. Since this attainment date is early in the ozone season for 2007, as a practical matter we should demonstrate attainment no later than 2006. Since actual attainment is assessed for three-year periods, attainment may be based on the three-year period 2004 through 2006. We can make a reasonable projection of attainment for this period by choosing 2005 as a year to analyze, since this year is in the middle of the three-year period prior to the attainment date. Using the same technique described for the projections of future 1-hour ozone concentrations for 2005 (section 3.8.1.3), we assume 80 percent of the NO_x controls for HGB are in place in 2005, and therefore assume approximately 80 percent of the reductions shown in Table 3-64. Recomputing based upon 80 percent of the proposed NO_x controls in HGB gives the results for BPA shown in Table 3-66.

Table 3-66: 2005 8-hour Design Value Recomputed for 80 Percent NO_x Controls in HGB

Monitor Site	Bmt/2	Ham/64	PAW/28	Sab/40	Mrc/42	JCA/43	WOr/9
DVm (1999-2001)	**80**	---	**85**	90	**82**	**89**	74
DVc (2001-2003)	78	**75**	78	**91**	76	86	**80**
RRF (Relative Reduction Factor)	.93	.88	.92	.89	.92	.93	.93
DVf (8-Hour Future Design Value)	74	66	78	80	75	82	74
80% RRF	0.941	0.903	0.932	0.908	0.932	0.938	0.941
2005 8-Hour DVf	75	67	79	82	76	**83**	75

Based on this technique, the highest projected 8-hour design value for 2005 is 83 ppb, which is below the 8-hour ozone standard. This data shows that the BPA area will be in attainment of the 8-hour ozone standard as required.

3.8.3 Conclusions

The agency has analyzed the response of short term, 1-hour ozone peaks to the controls that will be in place in 2005 and 2007 and has shown, through use of modeling and the relative reduction factor technique, that there will be significant improvements in air quality between 2000 and those two years.

The agency has also employed modeling and the relative reduction factor technique to show that, for 8-hour ozone concentrations, the BPA area will be in attainment of the standard by the attainment date of June 15, 2007, based on existing and proposed controls in Southeast Texas.

The 8-hour technical analysis is strengthened by several other factors that must also be taken into account. Several new Texas programs including cleaner diesel fuel, energy efficiency reductions from statewide building codes, and the Texas Emissions Reduction Program (TERP) as well as new federal programs will be coming on line in the future. As these additional programs are put into effect in Southeast Texas, the air quality will continue to improve.

3.9 ACCESSING MODELING DATA

All documentation and modeling input/output files generated in support of the BPA modeling described in this document will be archived. Interested parties can contact the TCEQ for information regarding data access or project documentation.

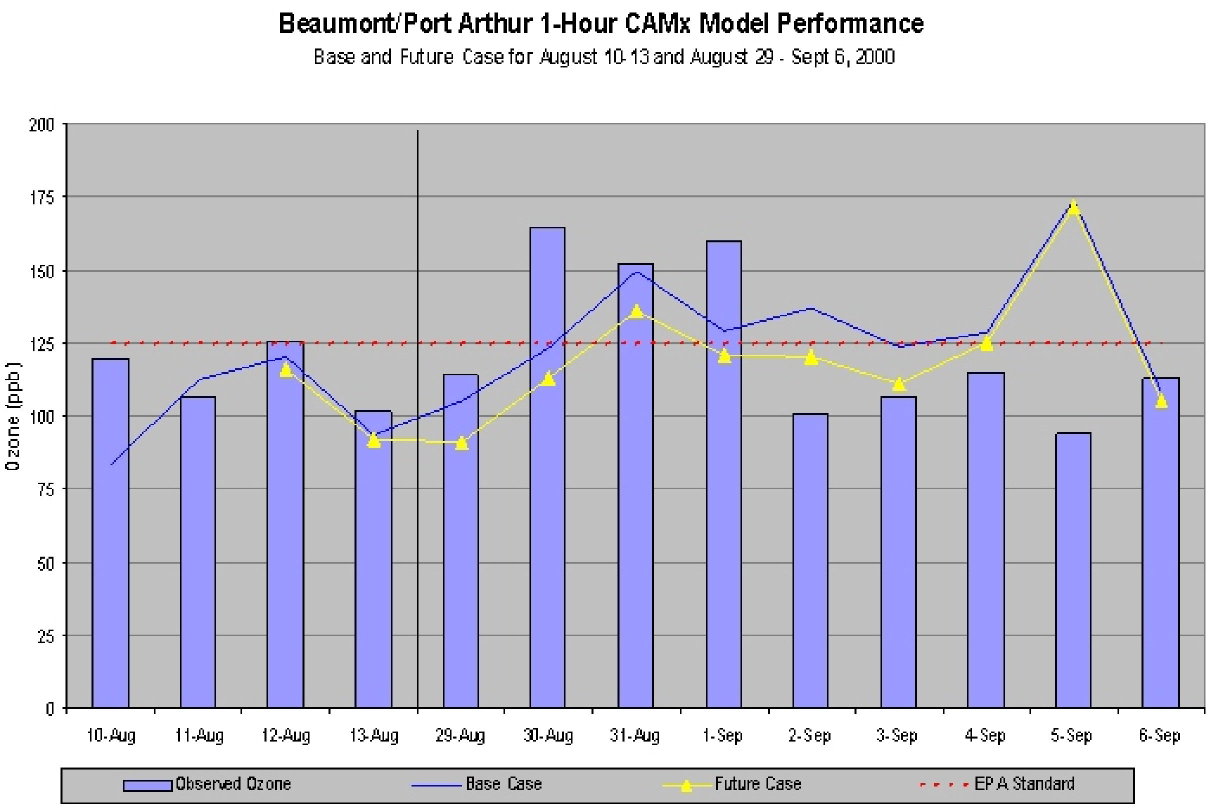

Figure 3.8-54: Beaumont-Port Arthur CAMx Model Performance

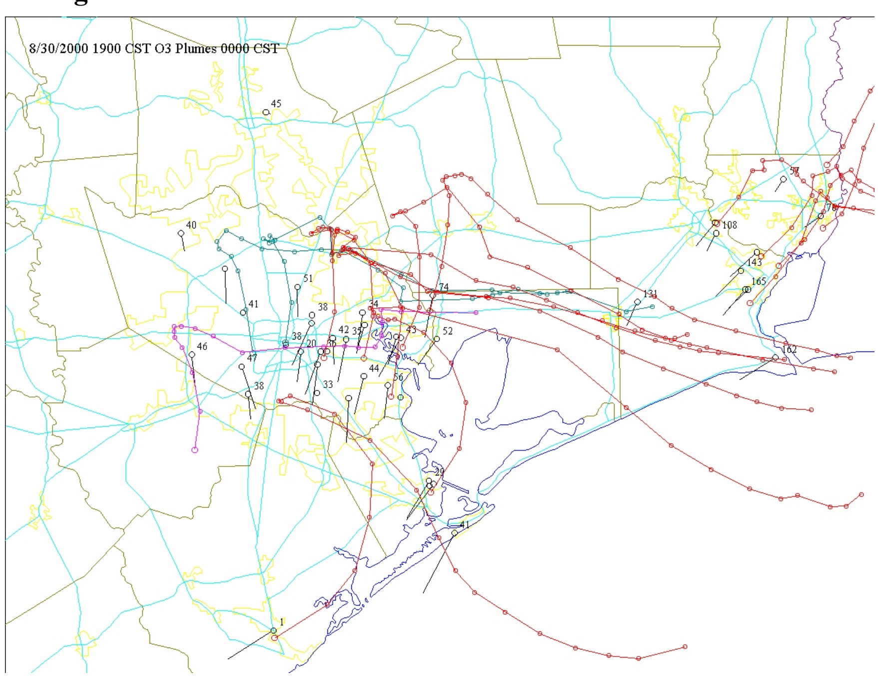

Figure 3.8-55: Houston Plumes on August 30, 2000

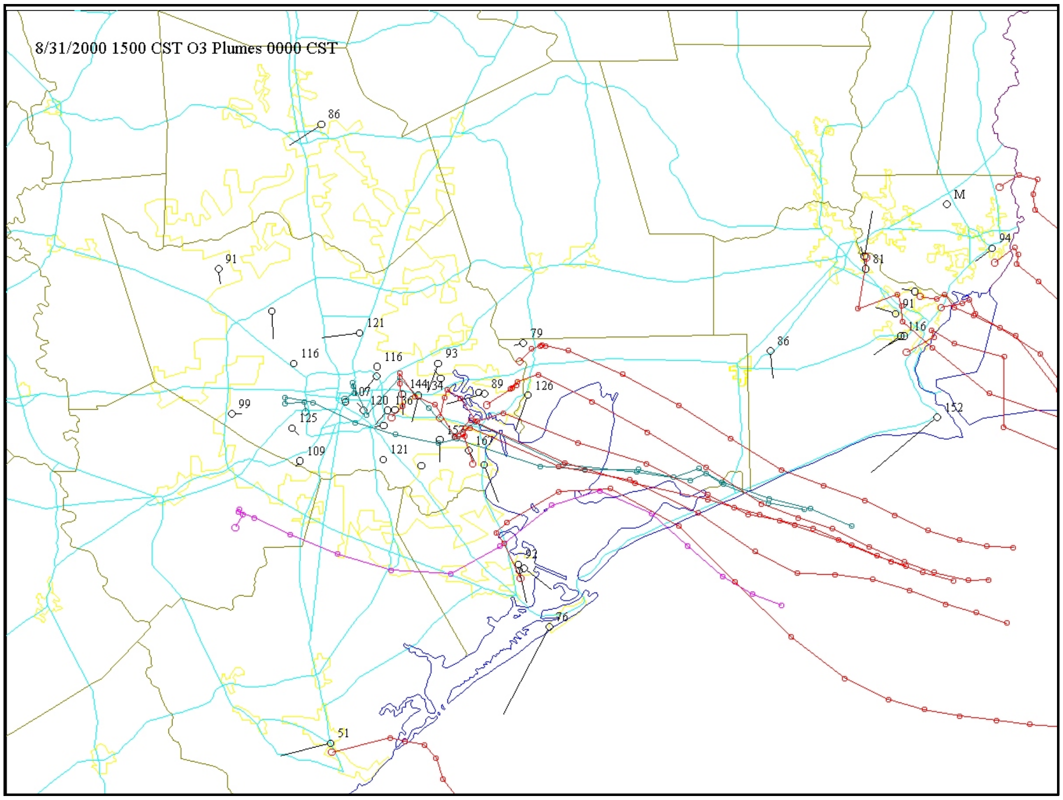

Figure 3.8-56: Houston Plumes on August 31, 2000

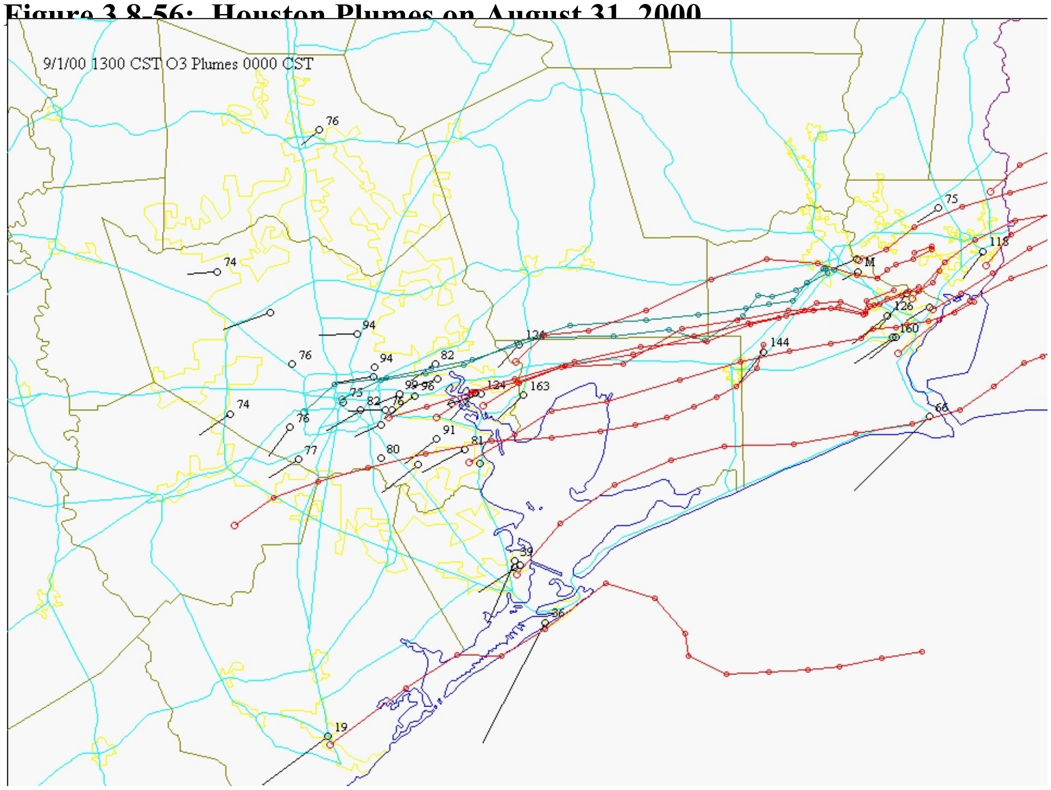

Figure 3.8-57: Houston Plumes on September 1 2000

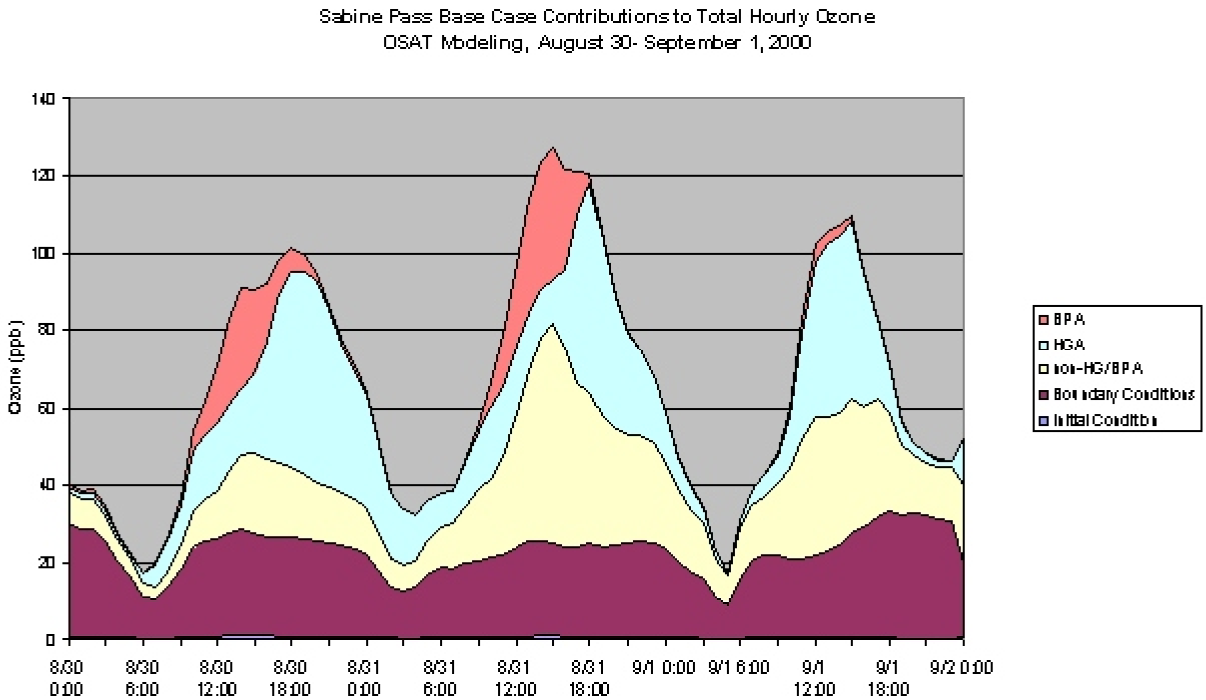

Figure 3.8-58: Ozone Source Apportionment at Sabine Pass